



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

to act,¹⁰ or into classes which are known to have lived in different environments, or comparing contrasted children within the same family, with contrasts in the ancestry of these (alternate inheritance) or other schemes which seek to find measurable influence of the environment factor, are, some or all, necessary for any final proof.

What the correlation coefficients *do* show is this, that if heredity be the great preponderating force, creating individual differences between man and man, the coefficients that have been found are in substantial agreement with what they should be.

Further refinement is wanted, especially as to the effect of assortative mating, and the shape of the curve of distribution for psychic characters, when selected classes are taken.

Mendel's laws, so important to the horticulturists, and to the breeder of superficial traits in fancy strains of domesticated animals, has not been shown to have any bearing on human heredity, at least as concerns important characteristics.¹¹ The general rough principle of alternate inheritance in human heredity, leads, however, to the hope that a further study of this question may bring out certain "unit characters," more or less marked, so that here in the end there may be harmony between the two unfriendly schools, the Mendelian and the Biometrical.

F. A. WOODS.

ORNITHOLOGY

Riddle on the Cause of the Production of "Down" and other Down-like Structures in the Plumages of Birds.¹—A connection is here traced between the rate of growth and the character of the

¹⁰ This method is employed by E. L. Thorndike in his excellent study of the "Measurement of Twins." *Arch. of Philos., Psychol. and Scientific Methods*, No. 1, New York, 1905. Also in some of the University College, London memoirs.

¹¹ It has been claimed to govern the inheritance of certain rare anomalies, albinism, abnormal hands, etc., also eye color (C. B. and G. C. Davenport, *Science*, Vol. XXVI, p. 589) and facial peculiarities of Red Indians when crossed with the Scotch (G. P. Mudge, *Nature*, November 7, 1907).

¹ Riddle, Oscar. The Cause of the Production of "Down" and other Down-like Structures in the Plumages of Birds. *Biological Bulletin*, Vol. XIV., No. 3, February, 1908, pp. 163-176.

structure in feathers. In a former paper² the same author showed that a feather is made up of a series of faint "fundamental bars," due to the manner of deposition of the feather substance. These bars are somewhat analogous to the annual rings of growth in the trunk of a deciduous tree, the tree rings showing the amount of annual increase in the tree trunk, while the bars mark the daily growth in the production of the feather. The demarkation of the fundamental bars is due to the period of reduced blood-pressure during the early morning hours (1-6 A.M.) of each day during the growth of the feather, and the defective transverse lines to malnutrition, or to reduced nutrition. As shown by Jones,³ the nestling down or neossoptile is not a distinct and complete feather growth, but merely an apical segment of the first definitive feather, the first down being "the plumulaceous tip of the first definitive feather." The constriction between the two parts Riddle considers to be another variety of this same defect, due to insufficient nutrition. At the time of the hatching of the egg the down portion of the down feather is completed, and the shaft portion immediately succeeds, at a time when the whole source of food-supply is changed, and assimilation impaired by the intervention of a new source of alimentation. While this is obvious, experiments have been conducted to show the effects of underfeeding at the critical stage in the bird's life, and it has been found that a bird in the downy condition can thus be made to wear its downy plumage for months after it should have given place to the definitive feathers. "The 'quill' region is a part of the feather which 'normally' *almost* refuses to grow; by reducing the food-supply during and after its formation further growth may be absolutely inhibited or stopped."

From the experiments here related, the author concludes that the down portion of feathers is due to poor nutritive conditions, and that "The formation of the quill is probably the direct result of a progressive diminution of an already lessened food-supply."

Apparently all this bears upon the "how" rather than the "why" of feather production and feather structure, and is not to be given a too-sweeping application. In other words, that in the development of a pennaceous feather, the formation of its different parts—the pennaceous, the downy, and the quill por-

² A Study of Fundamental Bars in Feathers. *Biol. Bull.*, Vol. XII, February, 1907, pp. 165-174. Noticed in *The Auk*, January, 1908, p. 98.

tions—is not to be ascribed to the varying conditions of nutrition of the individual during the growth of a particular feather. While we would accept the hypothesis that varying blood-pressure during the twenty-four hours may give rise to the phenomena of “fundamental bars” and “defective lines,” that defective areas may result from malnutrition, and that under-feeding may retard feather development, we can hardly conceive that we have here a full explanation of the differentiation of a feather into pennaceous, downy, and quill portions, or that the widely differing plumage structure shown by owls, pigeons and hummingbirds is merely a matter of nutrition, in its ordinarily accepted sense. In a moulting bird, for example, there may be hundreds of feathers in process of growth at the same time, and feathers in all possible stages of development. If reduced nutrition is necessary for the formation of the downy portions of the feather, and still further reduction of nutrition for the formation of the quill, how can all of these processes of feather growth take place, through experiment or otherwise, *in the same individual at the same time*, as we know is the case in an actively moulting bird? Each feather has its definite function, and its predestined form and character, in accordance with its position on the bird’s body; and feathers differ in character in different birds in accordance with their rôle in nature, depending upon whether they are owls, or swifts, or pigeons, or penguins, etc. Evidently the nutrition of the single feather and the nutrition of the individual bird are not necessarily one and the same thing; while defective or insufficient nutrition of the individual would leave its impress upon growing feathers, it is not likely that it would, in the case of a moulting bird, affect one phase or stage of feather growth without affecting all stages.

Each feather has its own cycle of growth, and the supply and quality of the nutrition for the perfection of its different parts must vary with each stage of growth, independently of degree of blood-pressure dependent upon food-supply. Hence we should not like to say that “The formation of the quill is probably the direct result of a progressive diminution of an already lessened food-supply,” but that it was due to the normally modified supply and character of the nutriment furnished by the blood-vessels to the feather at this particular and final stage of its

³ Jones, Lynds. The Development of Nestling Feathers. Lab. Bull. No. 13, Oberlin College. Noticed in *The Auk*, January, 1907, p. 90.

growth; or that the answer to Mr. Riddles's question, "What causes the production of 'down'?" is to be found in malnutrition of the individual.

J. A. A.

VERTEBRATE PALEONTOLOGY

New Fossil Mammals from Egypt.—It was announced some time ago that the expedition of the American Museum of Natural History to the famous fossil beds of the Fayûm had been highly successful, and particulars of the results have been awaited with much interest. Professor Osborn has just issued a short paper¹ describing some of the more remarkable discoveries. Two new forms, unfortunately represented only by portions of the lower jaw, are so peculiar that their ordinal position remains uncertain. One of these is named *Ptolemaia lyonsi*, and is taken as the type of a new family Ptolemaiidæ. It is even stated that it possibly represents a new order. The other, *Apidium phiomensis*, new genus and species, "was evidently a small omnivorous or frugivorous form with partly cuspidate teeth"; but at present its precise affinities are unknown. Two other fossils are described, representing new genera (*Phiomys* and *Metaphiomys*) of rodents, placed in the family Eomyidæ.

T. D. A. C.

Errata: The title of the article by Professor George H. Parker in the September issue, p. 601, should read "The Origin of the Lateral Eyes of Vertebrates." The figure on p. 606 is inverted.

¹ *Bull. Am. Mus. N. Hist.*, XXIV, 265-272, March 25, 1908.

(No. 501 was issued on September 30, 1908)